

## Dysuria, Frequency, and Urgency

KEITH WRENN

### Definition

*Dysuria* is any discomfort associated with urination. Abnormally frequent urination (e.g., once every hour or two) is termed *urinary frequency*. *Urgency* is an abrupt, strong, often overwhelming, need to urinate.

### Technique

The term *dysuria* is used to describe painful urination, which often signifies an infection of the lower urinary tract. The discomfort is usually described by the patient as burning, stinging, or itching. Pain occurring at the beginning of or during urination suggests a urethral site of disease, whereas pain after voiding implies pathology within the bladder or prostate area. Sometimes a patient will relate a history of pain in the suprapubic area.

In men, pain on urination is often referred most intensely to the glans penis regardless of whether the location of the disorder is in the urethra or in the bladder; the pain may persist between voiding. Specific questioning about a discharge from the penis should be undertaken, especially in younger men. Inquiries as to the character and volume of discharge are important. Gonococcal urethritis usually presents with a copious purulent discharge, whereas non-gonococcal urethritis commonly is mucoid and of small quantity. In older men, specific questions should be asked about associated hesitancy, intermittency, or straining. Ask the patient about standing closer to the toilet or taking longer to start than previously. These symptoms suggest obstruction, a common harbinger of infection, usually occurring either from prostatic enlargement or a urethral stricture.

In women with dysuria, the first question should be whether the discomfort is internal or external; in addition to urinary tract inflammation or infection, vaginal inflammation can cause dysuria as urine passes by the inflamed labia. If the sensation is internal or suprapubic, a urinary tract source is more likely; questions about associated fever, chills, back pain, nausea, vomiting, and prior urinary tract infections should be asked in an attempt to differentiate upper from lower urinary tract infection. If the sensation is "outside," then a vaginal etiology should be suspected. Questions about a vaginal discharge or itching should always be asked. Vaginitis and a urinary tract infection often co-exist, and vaginal infections in some populations are seen almost six times more frequently than urinary tract infections. Remember that women often do not spontaneously volunteer information about a vaginal discharge or vaginal itching. To help delineate the etiology of dysuria in the individual patient, both a urinalysis and a pelvic examination will often be necessary.

Ascertain the acuteness of onset of symptoms as well as

whether there is associated hematuria or suprapubic pain. Coliform or staphylococcal urinary tract infections are typically more acute in onset (less than 4 days) and more often associated with suprapubic pain and hematuria than are chlamydial infections. Women with chlamydial infections are more likely to use oral contraceptives and less likely to have a history of a urinary tract infection within the preceding 2 years. One should also inquire about the sexual history because chlamydial infections are more likely in women with a new sex partner. In addition, a history of a sex partner with recent urethritis or discharge might direct attention toward chlamydia or gonorrhea, which tends to be less symptomatic in the early stages of infection in women.

Historic information such as immunosuppression (diabetes mellitus, sickle cell disease, steroids, etc.), childhood infections, previous acute pyelonephritis, prior relapses or recurrences of urinary tract infections (especially if greater than three), underlying urinary tract disease (stones, prior instrumentation, congenital anomalies), or presence of symptoms for greater than 7 days define a population of women at risk for *subclinical pyelonephritis*. This clinical entity of an upper tract infection without the usual accompanying symptoms or signs of fever, chills, back pain, nausea, and vomiting is less amenable to short courses of therapy and more likely to relapse. Subclinical pyelonephritis occurs in up to 30% of women in typical primary care settings and in up to 80% of indigent women presenting with dysuria.

Urinary frequency should be differentiated from *polyuria*, which specifically relates to the passage of an abnormally large volume of urine in a relatively short period of time. Frequency of normal urination may vary considerably from individual to individual depending on personality traits, bladder capacity, or drinking habits. Because of this fact, a history of frequency is sometimes difficult to obtain. Changes in the pattern of frequency or a history of voiding more than once at night after retiring, however, are clues to urinary pathology. Ask about volume and voiding times, since a large bladder capacity may conceal an increase in urine production. Frequency commonly accompanies the dysuria associated with urinary tract infections but less commonly with vaginitis. Ask also about periodicity of symptoms because day frequency without nocturia, or frequency lasting only a few hours at a time, suggests nervous tension or a psychiatric cause.

Urgency may occur with or without voiding and frequently culminates in incontinence. With severe lower urinary tract inflammation, the desire to urinate may be constant with only a few milliliters of urine eliminated with each voiding. Urge incontinence must be differentiated from the other types of incontinence, especially stress incontinence. Urgency also more commonly accompanies the dysuria associated with urinary tract infections than that associated with vaginitis.

## Basic Science

Dysuria is related to inflammation of the lower urinary tract. Although an infection is usually the cause, other etiologies include crystalluria, calculi in the bladder and lower ureters, tumors (both frank carcinoma and carcinoma in situ), interstitial cystitis, trauma related to intercourse, local irritation or allergy from foreign bodies, instrumentation, applied chemicals, and the desiccation and thinning of urethral mucosa that occurs after the menopause in women. Significant infections without symptoms occur in between 6% and 9% of ambulatory women and about 4% of men. Conversely, up to 23% of women and 14% of men with dysuria do not have an infection. In certain subpopulations an increased prevalence of asymptomatic infections is seen. Risk factors include diabetes mellitus, pregnancy, and bladder pathology such as cystoceles, diverticula, and prostatic hypertrophy, or other conditions contributing to an increased residual volume.

In pregnancy, suprapubic discomfort and difficulty in urinating can occur in the absence of a urinary tract infection. In the first trimester it can relate to a retroverted uterus; in late gestation, it can be due to compression of the bladder by the fetal head. The diagnosis of urinary tract infection by symptoms is more difficult in late pregnancy because urgency, frequency, and suprapubic pressure can occur normally. Because of the consequences of urinary tract infections in both mother and fetus, careful attention to symptoms and frequent urinalysis are imperative.

The average adult bladder holds between 400 and 700 ml of urine. Normal patterns of urination may vary considerably; adults generally void 5 to 6 times daily but no more than once after retiring. The average 24-hour urinary output is 1200 to 1500 ml. Urinary frequency may occur because of either increased urine volume or decreased bladder capacity (i.e., less than 200 ml).

Increased urine volume can result from diuretic use, diabetes mellitus with osmotic diuresis, diabetes insipidus, compulsive water drinking, or loss of renal concentrating ability. The latter occurs early in many types of renal parenchymal disease including infection. There is also a diuretic response after termination of supraventricular tachyarrhythmias and with bedrest in the setting of edema.

Decreased bladder capacity can result from anxiety, operative procedures, obstruction with resulting residual urine and decreased functional capacity, a thickened inelastic fibrotic wall (from interstitial cystitis, irradiation, chronic infections such as tuberculosis and schistosomiasis) or inflammatory conditions that increase bladder sensitivity (e.g., pressure from intrinsic or extrinsic masses, calculi, or infections). Spastic neurogenic bladders also cause a decreased bladder capacity, whereas hypotonic neurogenic bladders with chronic large residual volumes (greater than 30 ml) mimic bladder outlet obstruction with a decreased functional capacity. Very low or high urinary pH can rarely cause frequency. Psychiatric disturbances are not infrequently reflected with symptoms of urinary frequency. Frequency is a common response to emotional stress.

Urinary urgency implies inflammation, often involving the trigone and posterior urethra. Stretch receptors in the bladder and posterior urethra subserve reflexes responsible for the urge to void. The urge to urinate usually occurs when the bladder approaches maximum capacity. Either inflammatory or neuropathic processes can lead to increased sensitivity of these receptors. Common clinical con-

ditions resulting in urgency include urinary tract infections, trauma, calculi, bladder tumors (especially carcinoma in situ), foreign bodies, and all the conditions that can lead to a decreased bladder capacity. Inflammatory edema of the mucosa, submucosa, and even the muscularis mucosa results in loss of bladder elasticity and subsequent pain from even mild stretching of the bladder. Urge incontinence is common in the clinical settings previously mentioned (including after a recent prostatectomy) and must be distinguished from other forms of incontinence, such as overflow or stress incontinence.

## Clinical Significance

The symptoms of dysuria, frequency, and urgency tend to occur together. They share many etiologies. Up to 25% of the female population each year will seek medical attention for a syndrome of lower urinary tract inflammation, accounting for greater than 5 million physician visits and millions of dollars in supplementary costs for tests and medications. Although it may be impossible to determine from symptoms alone whether an individual patient will prove to have a urinary tract infection (or to differentiate an upper from a lower tract infection), a careful history can provide important clues and enable clinicians to provide a rational and cost-effective plan. In up to 30% of patients who present with symptoms of, but prove not to have, a lower urinary tract infection, specific treatment for another condition outside the urinary tract will cure or ameliorate the symptoms. Prominent examples include vaginitis or inflammatory bowel disease.

While symptomatic or asymptomatic bacteriuria rarely leads to end-stage renal disease by itself, it is not an entirely benign condition. Early detection and treatment of urinary tract infections may relieve symptoms, prevent pyelonephritis, and decrease subsequent morbidity and mortality. Especially in pregnancy, the risks and costs of urinary tract infections are high. In men, these symptoms often imply a structural lesion of the urinary tract, and radiographs and surgical procedures are often indicated. Careful attention to this triad of symptoms is warranted, therefore, because subtle symptomatology can denote serious disease.

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